Regional Operational Plan CF.4K.2015.10

Foul Bay Special Harvest Area Adult Sockeye Salmon Sampling, 2015–2016

by

Natura Richardson

April 2015

Alaska Department of Fish and Game **Divisions of Sport Fish and Commercial Fisheries**

Symbols and Abbreviations

The following symbols and abbreviations, and others approved for the Système International d'Unités (SI), are used without definition in the following reports by the Divisions of Sport Fish and of Commercial Fisheries: Fishery Manuscripts, Fishery Data Series Reports, Fishery Management Reports, and Special Publications. All others, including deviations from definitions listed below, are noted in the text at first mention, as well as in the titles or footnotes of tables, and in figure or figure captions.

Weights and measures (metric)

centimeter	cm
deciliter	dL
gram	g
hectare	ha
kilogram	kg
kilometer	km
liter	L
meter	m
milliliter	mL
millimeter	mm

Weights and measures (English)

cubic feet per second	ft^3/s
foot	ft
gallon	gal
inch	in
mile	mi
nautical mile	nmi
ounce	oz
pound	lb
quart	qt
yard	yd

Time and temperature

day	d
degrees Celsius	°C
degrees Fahrenheit	°F
degrees kelvin	K
hour	h
minute	min
second	s

Physics and chemistry

all atomic symbols	
alternating current	AC
ampere	A
calorie	cal
direct current	DC
hertz	Hz
horsepower	hp
hydrogen ion activity (negative log of)	pH
parts per million	ppm
parts per thousand	ppt, ‰
volts	V
watts	W

General

Alaska Administrative Code	AAC
all commonly accepted abbreviations	e.g., Mr., Mrs., AM, PM, etc.
all commonly accepted professional titles	e.g., Dr., Ph.D., R.N., etc.
at	@
compass directions:	
east	E
north	N
south	S
west	W
copyright	©
corporate suffixes:	
Company	Co.
Corporation	Corp.
Incorporated	Inc.
Limited	Ltd.
District of Columbia	D.C.
et alii (and others)	et al.
et cetera (and so forth)	etc.
exempli gratia (for example)	e.g.
Federal Information Code	FIC
id est (that is)	i.e.
latitude or longitude	lat. or long.
monetary symbols (U.S.)	$, ¢
months (tables and figures): first three letters	Jan,...,Dec
registered trademark	®
trademark	™
United States (adjective)	U.S.
United States of America (noun)	USA
U.S.C.	United States Code
U.S. state	use two-letter abbreviations (e.g., AK, WA)

Mathematics, statistics

all standard mathematical signs, symbols and abbreviations	
alternate hypothesis	H_A
base of natural logarithm	*e*
catch per unit effort	CPUE
coefficient of variation	CV
common test statistics	(F, t, χ^2, etc.)
confidence interval	CI
correlation coefficient (multiple)	R
correlation coefficient (simple)	r
covariance	cov
degree (angular)	°
degrees of freedom	df
expected value	*E*
greater than	>
greater than or equal to	≥
harvest per unit effort	HPUE
less than	<
less than or equal to	≤
logarithm (natural)	ln
logarithm (base 10)	log
logarithm (specify base)	$\log_2$, etc.
minute (angular)	'
not significant	NS
null hypothesis	H_O
percent	%
probability	P
probability of a type I error (rejection of the null hypothesis when true)	α
probability of a type II error (acceptance of the null hypothesis when false)	β
second (angular)	"
standard deviation	SD
standard error	SE
variance	
population	Var
sample	var

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Alaska Department of Fish and Game, Division of Commercial Fisheries, Kodiak

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The Regional Operational Plan Series was established in 2012 to archive and provide public access to operational plans for fisheries projects of the Divisions of Commercial Fisheries and Sport Fish, as per joint-divisional Operational Planning Policy. Documents in this series are planning documents that may contain raw data, preliminary data analyses and results, and describe operational aspects of fisheries projects that may not actually be implemented. All documents in this series are subject to a technical review process and receive varying degrees of regional, divisional, and biometric approval, but do not generally receive editorial review. Results from the implementation of the operational plan described in this series may be subsequently finalized and published in a different department reporting series or in the formal literature. Please contact the author if you have any questions regarding the information provided in this plan. Regional Operational Plans are available on the Internet at: http://www.adfg.alaska.gov/sf/publications/

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SIGNATURE PAGE

Project Title:	Foul Bay Special Harvest Area Adult Sockeye Salmon Sampling
Project Leader(s):	Natura Richardson, Fishery Biologist I Trent Dodson, KRAA Research and Monitoring Manager
Division, Region and Area:	Division of Commercial Fisheries, Region IV, Kodiak
Project Nomenclature:	
Period Covered:	June 2015–June 2016
Field Dates:	June 1–18
Plan Type:	Category I

Approval

Title	Name	Signature	Date
Project Leader	Natura Richardson	Natura Richardson	4/16/15
Research Coordinator	Kevin Schaberg		4/17/15

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PURPOSE

The Alaska Department of Fish and Game (ADF&G) and Kodiak Regional Aquaculture Association (KRAA) operate a short-term fisheries monitoring and sampling project for adult sockeye salmon returning to Hidden Creek via Foul Bay on Afognak Island. ADF&G staff will collect biological information from at least 600 adult sockeye salmon for age, length, and sex composition. This operational plan provides information and instructions on how to perform the procedures associated with the fishery monitoring efforts of the Foul Bay Special Harvest Area.

The goal of the Hidden Lake Enhancement Project is to provide increased harvest opportunities of sockeye salmon to the common property fishery in the Kodiak Management Area.

The Foul Bay Special Harvest Area (FBSHA) is located within the Kodiak National Wildlife Refuge and the sampling project is a requirement of the United States Fish and Wildlife Service (USFWS) Hidden Lake Management Plan (Thomsen 2011). The KRAA project biologist will use collected data to author an annual summary/report to the USFWS (T. Dodson, Research and Monitoring Manager, KRAA, Kodiak, personal communication).

Key words: Foul Bay, Special Harvest Area, sockeye salmon, *Onchorhynchus nerka*, Afognak Island, Hidden Lake

BACKGROUND

The FBSHA is located on the northwest side of Afognak Island, approximately 72 km northwest of the city of Kodiak, and includes the waters east of 152°47.2 W (Figure 1). The Hidden Lake system is unable to support a run of anadramous fish due to an impassable falls 1.6 km upstream from the mouth of Hidden Creek (Honnold and Schrof 2001). Juvenile sockeye salmon (*Onchorhynchus nerka*) have been stocked annually in Hidden Lake since 1992 and return as adults to Foul Bay. The Foul Bay sockeye salmon run has been managed and monitored as a commercial salmon fishery since 1995. The broodstock for the Hidden Lake/Foul Bay fishery has primarily been Afognak Lake sockeye salmon reared at Pillar Creek Hatchery on Kodiak Island.

Returning adult sockeye salmon are harvested in the commercial salmon fishery within the Northwest Afognak District in the Foul Bay Special Harvest Area (Figure 1). The fishery is typically monitored early in the second week of June for an average length of seven days. Monitoring duties include estimating the build-up of returning sockeye salmon, estimating and sampling the sockeye salmon harvest, and estimating the incidental harvest of Chinook *O. tshawytscha*, chum *O. keta*, pink *O. gorbuscha*, and coho *O. kisutch* salmon.

OBJECTIVES

The objectives include the following:

1. Monitor the commercial fishery and estimate the daily commercial salmon harvest and build up in the FBSHA by species.
2. Collect age, length, and sex information from adult sockeye salmon.

METHODS

FISHERY MONITORING

The commercial salmon fishery in the FBSHA will be monitored from the time the fishery opens, usually between June 1 through 9, until approximately June 14. One ADF&G sampler will travel to FBSHA onboard the R/V K-Hi-C and will remain on the boat for the duration of the project. Groceries and skiff fuel to last the duration of the project should be purchased prior to leaving Kodiak, and sampling gear (fish measuring board, rugged digital assistant, etc) will need to be gathered and put on the boat prior to leaving port.

Once on site, the ADF&G sampler will record vessel names and record an estimate of the catch by species by observing sets and interviewing vessel skippers and tender operators each day. A portion of the commercial sockeye salmon catch from the FBSHA will be sampled for age, sex, and length data. The minimum sampling goal of 600 adult sockeye salmon will be necessary to assess the age composition of the FBSHA run.

There are three methods from which samples may be collected from commercial boats; onboard a tender, onboard a seiner, or by taking harvested fish back to sample at the K-Hi-C. If the sampler chooses to board a tender, samples must be confirmed to be from Foul Bay only. The sampler must be sure that fish could not have been already sampled via a different method or date (i.e. avoid collecting tender samples if a previously sampled boat that you have already sampled has delivered to the tender). When sampling from a seiner, timing is crucial. Keep the skiff out of the way of the net, seiner, and power skiff until the catch is almost in the boat and then approach. Ask to sample their catch, and if the boat agrees, choose whether to board the seiner and sample on deck, or to toss fish into the skiff and sample them at the K-Hi-C (be sure to return them to the correct seiner). If the seiner has a water hold, the fish will not be able to be sampled if they are already in the hold. If the seiner has an ice hold, fish may be sampled if the boat hasn't already provided samples. Take great care to avoid collecting duplicate samples; if a boat's catch has recently been sampled, don't take samples from their hold and if a boat you have recently sampled takes fish to the tender don't sample from the tender.

Follow adult salmon sampling methods as described (Wattum *In prep*). If further training in adult salmon sampling techniques is necessary, an experienced sampler will demonstrate the proper techniques before the sampler goes into the field.

DAILY FORMS/DATA TRANSFER

The sampler is responsible for the accuracy, completeness, and neatness of the collected data. The sex and length data shall be recorded using a No.2 pencil in a Rite-in-the-Rain book during daily sampling activities (Figure 2). Every day after sampling, these data shall be entered into a rugged digital assistant (RDA); which will then be backed up on the RDA and onto the provided laptop and memory stick. Vessel and estimate data will be recorded on the Vessel Monitoring Reporting Form (Figure 3).

SAFETY

Review specific sections of the ADF&G Safety standard operating procedures (SOP) manual that apply to the situations possibly encountered at your job site, prior to field deployment. Focus on the following sections of the manual: Policy/Standards, Aircraft/Passenger Safety, Emergency

/Survival Equipment Required in Aircraft, Boating Safety, Vehicle Safety, and Firearm/Bear Safety. After reviewing the above sections in the manual, the project supervisor will direct you to sign the Employee Safety SOP verification form that acknowledges that you have read the material.

All employees are required to attend and pass a certified CPR/First Aid/AED training course prior to field deployment. Employees should be familiar with the region's Emergency Response Plan.

COMMUNICATION SCHEDULE

Daily welfare call will occur at 0810 and 1630 with Commercial Fisheries Management staff and is conducted by dispatch when possible, or by Iridium satellite phone.

Be prepared to provide management staff with the following information during each daily contact:

1. General weather conditions (e.g., "1,000 foot broken ceiling, visibility 5 miles, winds are calm, and it's raining").
2. Fishery monitoring data:
    - Daily and cumulative catch per species
    - Daily and cumulative number of samples collected
    - Other information as requested
3. Logistics
    - Where the R/V K-Hi-C is at the time of the radio call and the area it is headed to.

SCHEDULE AND DELIVERABLES

TASKS

1. Monitor the commercial fishery and estimate the daily commercial salmon harvest and build up in the FBSHA by species. Target Dates: June 5–16.
2. Collect age, length, and sex information from adult sockeye salmon. Target Dates: June 9–13.

DELIVERABLES

1. Fisheries data will be reported on the Vessel Monitoring Reporting Form.
2. Age, length and sex data will be entered into the RDA, stored on the field laptop, and transferred to the Kodiak ADF&G office.
3. An annual summary and report will be submitted to the USFWS (e.g. Dodson 2013)

RESPONSIBILITIES

Project Biologist:	Natura Richardson – ADF&G Fishery Biologist
	Trent Dodson – KRAA Research and Monitoring Manager
Field Staff:	ADF&G Boat Officer

Ms. Richardson and Mr. Dodson will oversee the project operations and coordinate tasks so that the project goals are achieved. Ms. Richardson will work as the on-site sampler to collect and record data, as well as maintain responsibility for the timeliness and accuracy of all data collected. Mr. Pedersen will operate all marine vessels, coordinate daily tasks with Ms. Richardson, and assist as needed with monitoring and sampling. Mr. Dodson will be responsible for summarizing data and authoring reports required by the USFWS.

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FIGURES

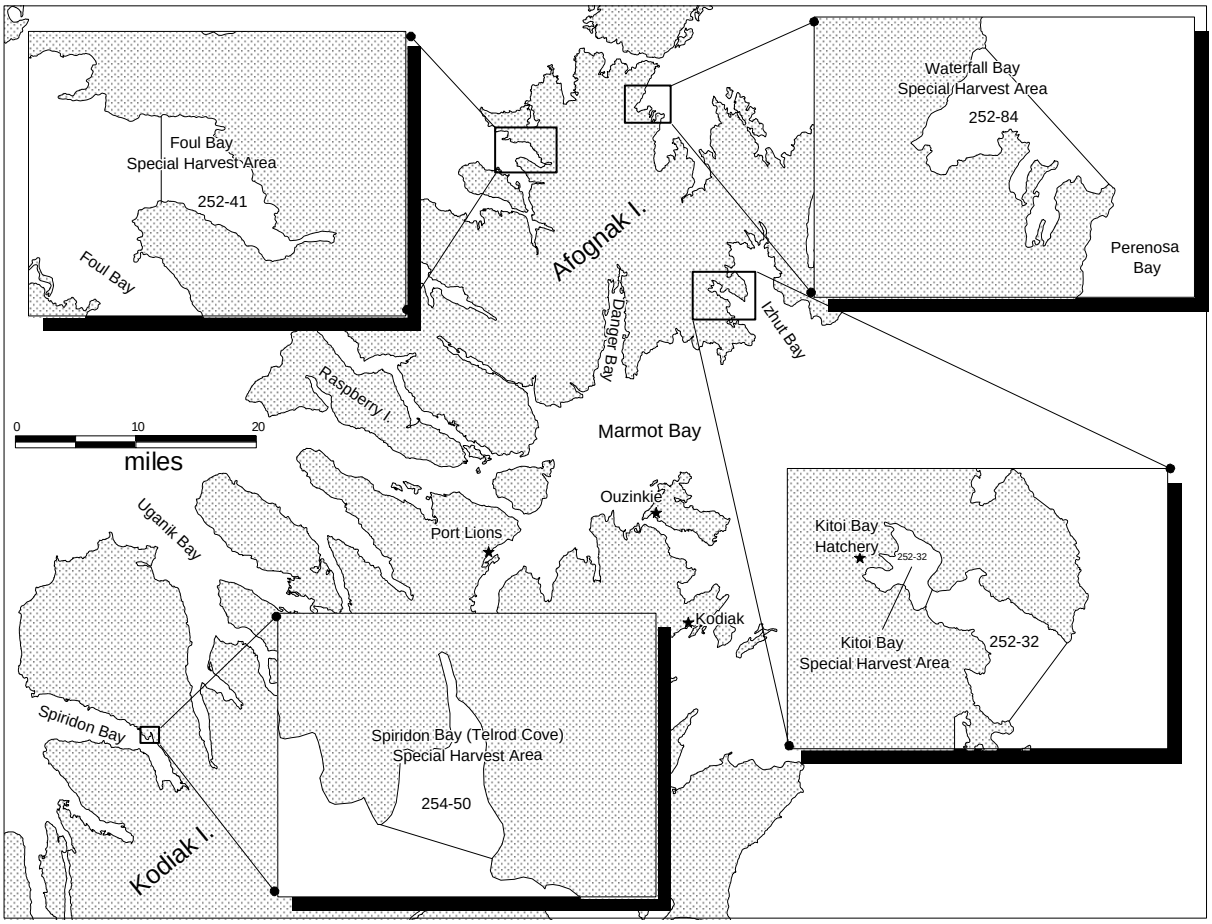
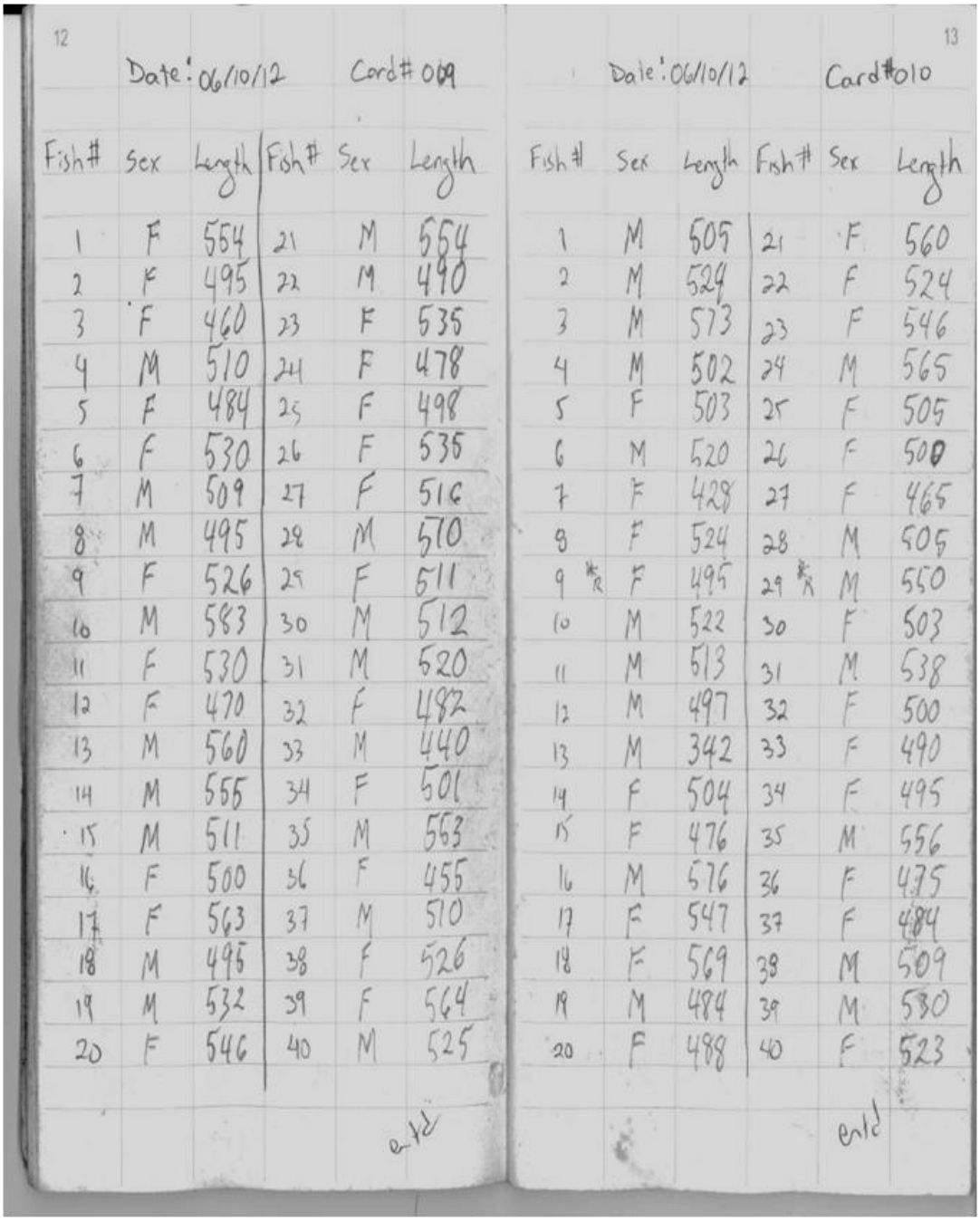


Figure 1.–Map of Special Harvest Areas, with FBSHA depicted in the upper left hand corner.



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Date: 06/10/12 Card# 009

Fish#	Sex	Length	Fish#	Sex	Length
1	F	554	21	M	554
2	F	495	22	M	490
3	F	460	23	F	535
4	M	510	24	F	478
5	F	484	25	F	498
6	F	530	26	F	535
7	M	509	27	F	516
8	M	495	28	M	570
9	F	526	29	F	511
10	M	583	30	M	512
11	F	530	31	M	520
12	F	470	32	F	482
13	M	560	33	M	440
14	M	555	34	F	501
15	M	511	35	M	563
16	F	500	36	F	455
17	F	563	37	M	510
18	M	495	38	F	526
19	M	532	39	F	564
20	F	546	40	M	525

end

13

Date: 06/10/12 Card# 010

Fish#	Sex	Length	Fish#	Sex	Length
1	M	505	21	F	560
2	M	529	22	F	524
3	M	573	23	F	546
4	M	502	24	M	565
5	F	503	25	F	505
6	M	520	26	F	500
7	F	428	27	F	465
8	F	524	28	M	505
9 *R	F	495	29 *R	M	550
10	M	522	30	F	503
11	M	513	31	M	538
12	M	497	32	F	500
13	M	342	33	F	490
14	F	504	34	F	495
15	F	476	35	M	556
16	M	576	36	F	475
17	F	547	37	F	484
18	F	569	38	M	509
19	M	484	39	M	580
20	F	488	40	F	523

end

Figure 2.–Example of raw data entry in a Rite in the Rain field notebook.

Foul Bay Special Harvest Area Vessel Monitoring Reporting Form			
Date	Number of Fishing Boats	Name of Vessel(s) Fishing	Number of Scales Collected
TOTALS:			

Figure 3.–FBSHA Vessel Monitoring Reporting Form.

APPENDIX A. STATISTICAL (SAMPLING) WEEKS

Appendix A1.–Statistical (sampling) weeks and associated calendar dates.

Week	Calendar Dates	Week	Calendar Dates
10	1-Mar – 7-Mar	28	5-Jul – 11-Jul
11	8-Mar – 14-Mar	29	12-Jul – 18-Jul
12	15-Mar – 21-Mar	30	19-Jul – 25-Jul
13	22-Mar – 28-Mar	31	26-Jul – 1-Aug
14	29-Mar – 4-Apr	32	2-Aug – 8-Aug
15	5-Apr – 11-Apr	33	9-Aug – 15-Aug
16	12-Apr – 18-Apr	34	16-Aug – 22-Aug
17	19-Apr – 25-Apr	35	23-Aug – 29-Aug
18	26-Apr – 2-May	36	30-Aug – 5-Sep
19	3-May – 9-May	37	6-Sep – 12-Sep
20	10-May – 16-May	38	13-Sep – 19-Sep
21	17-May – 23-May	39	20-Sep – 26-Sep
22	24-May – 30-May	40	27-Sep – 3-Oct
23	31-May – 6-Jun	41	4-Oct – 10-Oct
24	7-Jun – 13-Jun	42	11-Oct – 17-Oct
25	14-Jun – 20-Jun	43	18-Oct – 24-Oct
26	21-Jun – 27-Jun	44	25-Oct – 31-Oct
27	28-Jun – 4-Jul	45	1-Nov – 7-Nov